Internet Handbook

for island teachers

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Acknowledgements and Introduction

This manual has been written for PEI teachers who have subscribed to the idea that the Internet is a tremendous research tool which will enhance the present curriculum and reinforce essential problem solving skills in their students. The main objective of this manual is to help its users gain the optimal benefits from any interaction with the Internet. For teachers this means professional development and for students this is learning. However, any manual will quickly outlive its usefulness unless it evolves and changes with the needs of its users and changing technology. For this reason it is hoped that your input, suggestions, criticisms and new ideas will make this manual the useful tool it was intended to be. Any suggestions may be directed to Peter Griesbauer at 368-5725 (e-mail: pgriesba@peinet.pe.ca).

The present manual has been created by staff of the Dept. of Education - Technology Centre, collectively referred to as the Internet team. This team consists of:

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History of the Internet

Information Highway	The Internet has been called the "world's largest computer network" and it has been compared to a highway, which led to its alternate name: *Information Highway* or *Infobahn*. Both of these concepts indeed provide an understanding of what the Internet really is. Physically, the Internet is a huge collection of individual computers, which are connected with each other through telephone lines and through other networks. On this net, like on a highway, information is passed between these various computers. Since computers of various makes and configuration are attempting to talk to each other, it is essential that they all talk the same language and follow the same rules of information exchange. This set of rules, within the context of the Internet, is called a protocol and is referred to specifically as the *TCP/IP* (Transmission Control Protocol/Internet Protocol). This common language and set of rules in turn allows us to define the Internet as that net of computers that follows the TCP/IP protocol.
History and Development of the Internet	The Internet started in the 1960s as a US Department of Defence network which was then called ARPAnet. The original purpose of this net was to allow scientists and military personnel to exchange information and to build a net which would allow communications to be maintained in case of war. The popularity of this net, however, grew in leaps and bounds and soon there was a need for a bigger and better net. In response, the US National Science Foundation developed in the mid-80s a new "Net Concept" by creating a number of supercomputer centres and connected these centres with very fast (56kps) telephone wires (this translates to about two typewritten pages per second).

At this point every University and College wanted to be part of the net and the cost of connecting all schools with the very expensive telephone wire would have been astronomical and could not be carried by the Science Foundation. Instead, the schools connected to each other, thus creating regional networks, and the end of this chain was then connected to a supercomputer. Since the supercomputers were connected to each other a true net was created, in which each computer was connected to every other computer. Actually, the final configuration resulted in the observation that the Internet is not a net but a collection of nets. At the end of the 80s, however, this network proved to be too slow and in need of a major overhaul. New and about 20 times faster telephone wires replaced the old ones and the supercomputers were also replaced by much faster and more powerful ones.

Timeline

Appendix A at the back of this manual contains an interesting timeline which shows the development of the Internet from its beginnings to the present. Also contained in Appendix A is a growth summary table which documents the phenomenal growth of the Internet.

Definitions

What is the Internet?	
Physically	Physically the Internet is a huge collection of individual computers and networks that are connected with each other through telephone lines and through other networks. On this net information is passed from computer to computer.
IP Internet Protocol	Because computers of many different makes and configurations attempt to talk to each other, it is essential that they all talk the same language and follow the same rules of information exchange. This set of rules, within the context of the Internet, is called a protocol and is referred to specifically as the **IP** (Internet protocol). This common language and set of rules in turn allows us to define the Internet as that of computers that follows the TCP/IP protocol.
TCP Transmission Control Protocol	TCP is a second protocol that is being used by the Internet. It takes the information you wish to send and breaks it into pieces called packets. Secondly, it numbers each packet in the order to be sent and adds a check number which allows the receiving computer to check whether data arrived without any damage.
TCP/IP **How does the Internet Work?**	A technical description of the Internet is *Packet Switch Network*, which means that your packet of information is sent with everyone else's packet. The various regional networks are connected by computers call *routers* which take various packets of information and "route" them to another router, according to their address, and so on until it reaches its destination. This depends on your packet containing the correct address which brings us back to the Internet protocol (IP).

One of the rules specified by the IP is that each packet must contain an address. For example, a typical network address may look something like this: 198.167.2.8 which specifies, like a postal address, the regional net, the subnets, and the individual user. A packet can be 1 to 1500 characters long and again, each packet must contain the address to which it is to be sent. The reason for limiting the size of a packet is simply so that no one can monopolize the net with their gigantic packets - every user has a fair chance to send his/her packet. Still problems arise - packets can get lost or damaged, they arrive out of sequence and their size is too small for most information we wish to send through the net. In order to solve these problems, a second protocol is being used in the net, namely the *transmission control protocol* (TCP). IP is responsible for the data being sent to the appropriate address whereas TCP is responsible for the correct item being sent reliably.

The Domain Name System

The above example of a net address was composed entirely of numbers, delimited by periods. This method of addressing is hard to remember and therefore for the convenience of the human users, names were given to the computers on the Internet. Our local access system, Sympatico has the domain address **sympatico.pe.ca**. This computer is known to the entire Internet since it has a unique IP address. This computer is the responsibility of and is maintained by Sympatico, which in turn is located in **'pe'** (Prince Edward Island, Provinces and States use two letter abbreviations), which is located in **'ca'** (Canada). Each set in the above name is called a domain and each domain is separated by periods. Many domain addresses do not end with a country code but rather with a code that identifies the nature of the organization to which the host computer belongs. For example, yaleinfo.yale.edu (Yale University), pdb.pdb.bnl.gov (a US government computer). Other domains: com (commercial organizations), edu (education), mil (military), org (organizations), and net (Network Resources).

103-05318/

Internet Connection
Internet Access Provider

Many people and even some texts suggest that a connection to the Internet is simply a matter of dialling a number through a modem and one is connected to the Internet. This, strictly speaking, is an oversimplification. A home computer is unlikely to connect directly to the Internet since most home PCS lack the essential TCP/IP software to speak the net's language. We must connect our home computer to a computer that has this protocol (an *Internet Access Provider,* or more commonly, *Internet Service Provider* (ISP).) In our case, Sympatico has a computer that has the TCP/IP protocol and therefore can help us access the Internet, once we have established connection with its computer.

Social Implications

In its present form, we could say that the Internet consists of over 13 million libraries or sources of information. Some of these are strictly commercial, ie. businesses that sell goods and/or services. Others provide mainly general information such as weather forecasts, news, references, dictionaries, etc., and others again offer very specific information such as academic or governmental data. With increasing frequency many hosts offer the possibility to obtain pictures, movies, and sounds in addition to written documents.

A word of caution is necessary within this context. With over 13 million hosts it stands to reason that there is also a lot of garbage on the Internet and moreover, there will be a considerable number of sites that offer material of questionable taste. This brings us to a new definition of the Internet. The Internet is the only system known to mankind that is a total anarchy, but - and this is the surprising part- an anarchy of cooperation that works and continues to grow. There is no single organization that controls or owns the Internet, it covers the globe and disregards boundaries, it grows through the efforts of its users without any direction or censorship.

The Internet Manual
Definitions

What does the Internet mean for Education?

There are many questions about the Internet that educators have asked themselves and will continue to ask themselves. These questions range from a very basic "What is the Internet?" to a more practical question such as "How can I use it?". Since the Internet is a relatively new addition to our lives and our schools there is a great temptation to think that this latest development in telecommunications is perhaps just a novelty. However, once our questions are answered and we begin to see the implication of the Internet on our lives and the lives of our students, we find that quite the opposite is true. "The Internet is "...a microcosm of our society. Most of what happens in the real world is in some way reflected on the Net." This is because most of the resources we find in our communities, towns, and cities are found on the Internet. On the Internet we can find libraries, radio programs, shopping malls. On the Internet we can meet friends, take courses, subscribe to magazines and obtain information on many, many subjects. The Internet is a very immediate and up to date source of news. It can be a host to a forum of dialogue with other people about current events, as well as a place to find out about government activities and jobs. For our students the Internet offers learning resources, the electronic equivalent of pen pals, known on the Internet as keypals, and a place to publish stories and pictures.
The importance of the Internet today is much the same as the importance of a student's entire education. We educate our students today so that beyond public school these students will continue to be productive and active members of society. We work hard to ensure that the skills we presently teach students will be of great use to them when they become independent members of society. The prediction has been made that in the year 2000, two thirds of **all** work will involve some form of computerized information. Keeping this in mind, it is important that we offer our students the opportunity to learn how to access, analyze and communicate electronic information effectively. Although the role telecommunications plays in our lives is not near the role it will play in the lives of our students, the skills our students need to guide themselves through this technology can be learned today. [1]

[1] Heide, Ann & Stilborne, Linda (1996). The Teacher's Complete & Easy Guide to the Internet. Trifolium Books, Inc., Toronto, ON.

The Driving Force of the Future

According to Hobbes' Internet Timeline (see Appendix A) the Internet has, on average, doubled in size over the past six years. This phenomenal growth rate is a good indication of the impact that technology will have on our students. Because we are currently influenced by technology as a driving force in our culture and economy, it is only to the benefit of ourselves and our students that we incorporate it into the curriculum in a meaningful way. This does not mean that we teach computer as a separate subject, but rather we use the technology we have as a tool to help us teach language arts, science, math and research skills (see Appendix B).

Summary

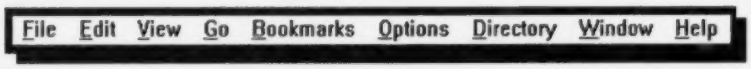
In summary, students and teachers need to develop the necessary skills to make use of Internet resources, become creators of and contributors to the Internet, explore future work and learning opportunities, and process information intelligently.

The Browser

	The purpose of this Manual is to get you cruising as fast as possible. For this reason the manual leaves out a lot of detail but on the other hand, it will explain all the "tools" and "gadgets" needed for a successful cruise.
Definition	The Internet has been compared to a data highway. In the spirit of this analogy, it is referred to in various publications as "Infobahn", "Data Autobahn", and "Information Highway". In a similar vein, people talk about "Cruising the Infobahn", which of course implies that you have a vehicle in which you can do the cruising. Your Internet vehicle is called a *browser* and your main instrument to control its direction is the mouse (ie. that little gizmo beside your keyboard that doesn't look like a mouse). The mouse has two buttons (some have three) and to depress one of these buttons is referred to as "*clicking*". To activate one of the menu items, bring the mouse pointer to that item and click the left mouse button. When manuals talk about a "*double-click*", they mean to depress the left mouse key quickly twice. Finally, you may wish to select or highlight some text; this involves "*dragging the mouse*", which translated means, to bring the mouse pointer to the beginning of the text you wish to select, press the left mouse key, keep it depressed and move or drag it to the end of the text to be selected. The selected text will be highlighted and is now ready to be manipulated (see browser menu item EDIT on the next page for more details.)
The mouse	

The Menu

When you look on top of the screen you see the "Menu Bar" with these menu items:



Some of these Menu items are self-explanatory (eg. Directory, Window and Help) and will not be discussed but others may need a bit of explaining. To activate any of the available menu items click on it with the left mouse key **or** press the Alt key and while you keep it depressed, press the underlined letter indicated by the menu item.

File

The FILE menu allows you to SAVE the current page, to PRINT, to EXIT the browser and to CHECK FOR NEW MAIL.

Edit

Cut & Paste

Copy text from an Internet page into your word processor.

The EDIT menu is very useful when you wish to incorporate some text from an Internet page into a word processing document. Highlight the desired text and then click on EDIT. In Edit select: COPY, press Alt + Tab (keep the Alt key depressed and press the Tab key repeatedly) until you see, somewhere in the middle of the screen, the words: "Program Manager". Open your word processor and when the word processing document screen is active, click on the EDIT menu item of your word processor. Now select PASTE and the text from the Internet page is now in your word processing document. Save your word processing document and return to your Internet page by using the Alt + Tab keys again.

Go

At times you may get so lost in jumping from one site to another that you wish that you could return quickly to your home base or starting point. Your wish shall be granted by clicking the GO menu item. The History of your latest excursion is recorded. All you need to do is to click on the name of the site to which you wish to return quickly.

Bookmarks

In this menu item you can save the address of a site which you find particularly interesting and which you may wish to visit again. Simply click on BOOKMARKS and then ADD BOOKMARK. When you want to review the recorded sites, click on BOOKMARKS, select GO TO BOOKMARKS and once you have found the site you wish to re-visit, double-click on it.

Create folders

After a few cruises on the Infobahn you may have a long list of bookmarks. You can organize your bookmarks into folders, which in turn can be sorted into an alphabetical order. To create folders, go to the bookmark menu and select: GO TO BOOKMARKS. Highlight the top folder (it is the master and contains all other folders). Now select ITEMS and then select INSERT FOLDER. You will be prompted to give the folder a name. Repeat this for all other folders you wish to create. Now go to your list of bookmarks and select all those which should go into the first folder. To do this hold down the Ctrl key and while you keep it depressed, click on the bookmark to be selected. It will now be highlighted. Repeat this for all other bookmarks. When you have selected them all, go to one of the highlighted ones; press your left mouse key but keep it depressed and drag the items to the new folder. Repeat this for all other folders. Your bookmarks are now nicely ordered into folders but they are not sorted yet. Close all folders (double-click the open folder name). An open folder shows you all the files inside and has a "-"sign beside the folder icon, whereas a closed folder has a "+" sign beside it. Now go the top folder name (master) and select "ITEM" and then SORT BOOKMARKS.

Place bookmarks into folders

Open and closed folders

Sort folders and bookmarks

Options

The OPTIONS Menu enables you to set your preferences within the browser. If, for example, you wish to load the Internet pages without pictures (definitely faster), click the AUTO LOAD IMAGES so that no checkmark is before this item. The various items in GENERAL PREFERENCES are best explained by the instruction sheet of your access provider (eg.Sympatico Guide to the Internet). However there is one item that may come in handy. From time to time, you will obtain a page that is very unreadable. The background colour may have little, if any, contrast to the text. To remedy this, click on OPTIONS and select: GENERAL PREFERENCES. In the ensuing sub-menu select COLORS and check the box near the bottom of the screen, entitled: "Always Use My Colors...." and after all that, click the OK button. The page should have improved its readability.

The Button Bar

In order to keep it simple, only the most important buttons are discussed. The purpose of most other buttons is obvious.

Back

Forward

The *Back* and *Forward* buttons enable you to go to the previous (next) page from your present one. If one of the buttons appears to be shaded (ie. the text is gray rather than black), it means that this button is not available at present. For example, the forward button will be shaded until you actually use the back button. Think about it.

Home

Isn't it nice to know that there is always an easy and quick way to go home - *Home* refers to the page that is initially loaded with your browser. Incidentally, you can determine which Home page should load at the beginning of every session in the OPTIONS Menu, GENERAL PREFERENCES, APPEARANCE.

Images

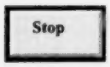
Assume you have turned off the automatic loading of images. In this case the *Images* button will be active (ie. not shaded), which in turn means that you can turn it on to see the images of a given page. Sometimes you may have to press also the *Reload* button to reload the page.

Open

One way of cruising the Internet is to know the address or URL of the site to which you wish to go. Click on the *Open* button and a small window appears into which you can type the address. Once you have typed it, click the OK button and, if your address was typed correctly and the host is accepting visitors you should soon have arrived at your destination.

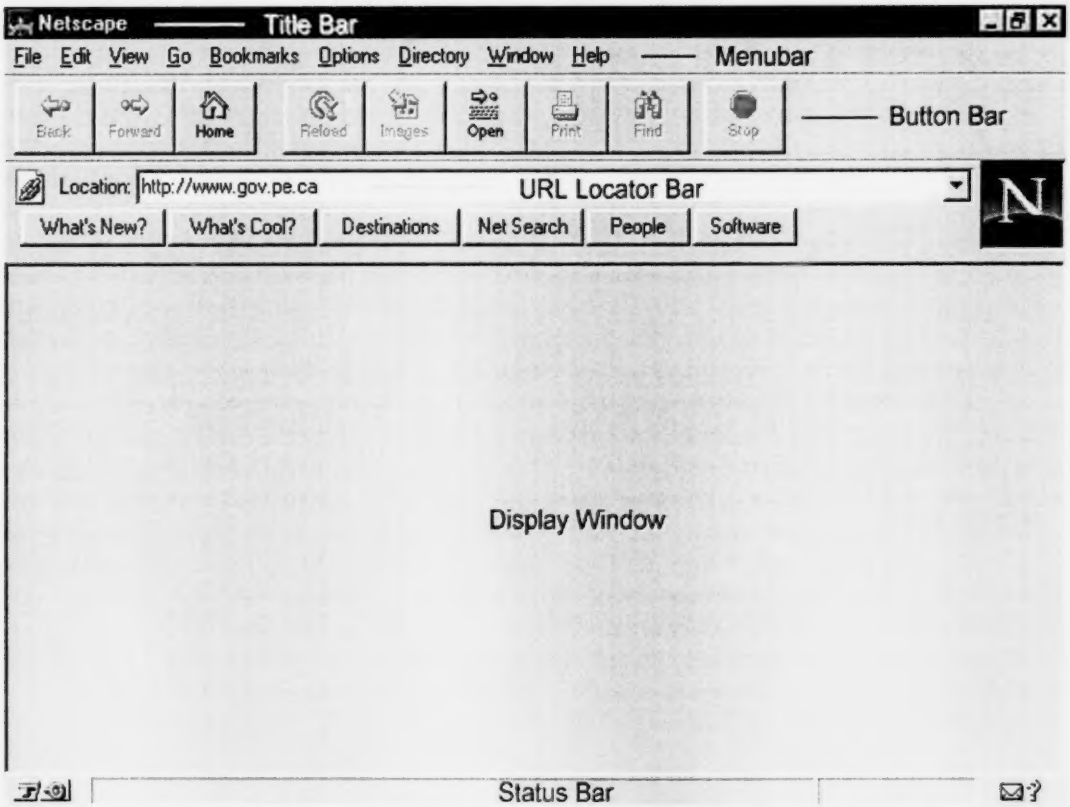
Find

If you are looking for a specific occurrence of a word in a given page, you can use the *Find* button and type the word(s) you are looking for into the ensuing window. If this word occurs in the text of your document, its next occurrence will be highlighted. You can repeat this search until the browser cannot find another occurrence of this word.



At times (more often than one wishes) the page of a site seems to take forever to load. There may be many reasons for this, but most likely the host is too busy to respond to your request. Look at the Netscape icon and you see stars flying by, indicating that the browser is trying to make a connection or receiving data or is just waiting. At the same time the *Stop* button has turned on a red light in the middle of the button. If you have waited too long and wish to stop the search or wait, click on the Stop button and your browser is ready to receive your next request.

The Browser Screen - Your Vehicle for Cruising the Web.



The Internet Resources

World Wide Web (WWW)

The major Internet Resources	**Archie:**	The resource that allows you to search for the location of a program file.
	E-Mail:	Apparently the most often used resource of the Internet. It permits the sending/receiving of electronic mail. This mail can be notes, messages, or whole documents.
	FTP:	The protocol that allows you to obtain (download) a program or file into your computer.
	Gopher:	A menu program which allows access to information through menus (text - based).
	News Groups:	A forum of users with similar interest who exchange ideas and information via the Internet.
	Telnet:	Enables you to log on to a remote host and your computer becomes one of its terminals. Often used for libraries.
	Veronica:	A method of searching Gopher menus with keywords.
	WWW:	World Wide Web - a resource that allows the user to use most of the above resources and to explore the Internet through hypertext links. Moreover, it allows the user to search information with specific keywords.

The World Wide Web

An introduction to WWW

The World Wide Web - *WWW* - is a networked hypertext information system. Once you start a program which accesses a WWW site (these programs are called *Browsers* or *Clients*), you can access other resources and services on the Internet (for example, Gopher or e-mail).

Home Page

When you start a browser such as Netscape, you will be presented with a *home page*. A home page is a document (usually a welcoming document) of the site or host to which you connected.
When you look at a home page, or for that matter any WWW document, you can observe the three characteristics of WWW: GUI, hypertext and URLs.

Graphical User Interface (GUI)

When you start your browser, you will discover the first big innovation from the early Internet days, namely, that it is very graphically oriented. Instead of typing arcane commands, you achieve the same results with a click of your mouse. This graphical environment is referred to as *Graphical User Interface (GUI)* and has significantly contributed to the popularity of the Internet. Its importance cannot be overstated, in that it has made cruising the Internet so much easier.

Hypertext

The second and certainly most important characteristic of WWW is the inclusion of *hypertext* in its documents. If you look at a home page, you will notice that some of the text is written in a different colour (usually blue) and is, very often, underlined. Such text is referred to as a *link* to other documents. Click on it, and the browser will attempt to connect you to the site to which the link points and if available, will load the document specified in the link. Another way of easily identifying a link is to observe the shape or form of your mouse pointer. When you move your mouse, the pointer on the screen usually has the shape of an arrow, but when you move it over a link, it will change into a hand.

URLs

Most WWW browsers display a window called "*Location*" or "*Source*" which contains the address of the page you are presently viewing. In Internet lingo, this address is known as *URL* (*Uniform Resource Locator*). Unlike any other resource on the Internet, WWW specifies the address of every document (page). In contrast, E-mail gives every user a unique address and in Telnet and FTP host computers are accessed with their specific address. Since every WWW document has its unique address, we can use URLs to find information and/or to access a particular document immediately. With millions of documents available on the WWW, the ability to use URLs to locate information is essential.

Summary

In summary, WWW is an Internet resource that has three distinguishing characteristics, namely, GUI, hypertext and every document has its own specific address, referred to as URL.

Background

How to find information on WWW

In this section we are going to learn how to search the Internet for information. The Internet, in its present state, contains a lot of information but it is not always easy to retrieve. Moreover, you may soon gain the impression that there is too much information and your task is not only to find the information but also to select only that which is pertinent to your task. Lycos (a search engine) claims to have indexed 66 million URLs (PC Magazine, Dec.1996). Given these statistics, the Internet may be likened to a book consisting of over 66,000,000 pages, but alas, these pages are not put together in an organized fashion. However, this apparent lack of organization does allow the user to make and build their own connections and organization depending on the purpose they have for the information.

The five basic methods for finding information

Basically, there are five methods to search the Internet. These methods differ widely in their approach to a given query and your preference will depend on your knowledge regarding the query and to some extent on your personality. If you cannot find the information with one method, try another one. The methods of searching are:

Browsing: This method is comparable to window shopping. You are only guided by your interests and momentary whims. This method is probably the least productive but, if you have a lot of time on your hands, it can be the most fun.

URLs: Consult friends, books, magazines, etc., for the addresses of WWW sites which may lead you to the desired information.

Lists: These are catalogues of subjects on the Internet. These have been established by individuals and offer a wealth of information. They can be somewhat compared to a library catalogue.

Search Engines: Search Engines are programmes that search a data base for the keywords you have specified in your search. Many of these engines allow you to conduct complex searches with Boolean operators such as "AND" and "OR".

E-mail: Ask someone on the Internet to help you find the information. We will be discussing E-mail in greater detail in one of the next sections.

There are of course other ways to search the Internet. One is to post a request for help to a News group but in essence this approach is similar to that of using E-mail. Another possibility is to pay a consultant to search for you but be warned that this approach can be very expensive.

Browsing

When you have started your browser and you 'aimlessly' move from site to site, governed only by your momentary whims and interests, you have engaged in the time-honoured activity which has its parallels in window shopping or the Sunday afternoon drive in the country side. We may "jump" all over the place and although our cruising appears aimless, we have (hopefully) fun just following our inclinations. Often these turn out to be the most successful cruises, because we are delighted, if we catch a real find and if not - we still achieved what we wanted, namely, just cruising along.

Bookmark

If you find a site which you may wish to visit later on again, make its URL a bookmark. Click on the menu item BOOKMARKS and then click on ADD BOOKMARK. The URL of your present site is now recorded and when you wish to re-visit this site, you need only to select, in the list of bookmarks, the recorded site and press the Enter key.

As a search method for a specific topic, browsing is not recommended. However, as a method for gathering interesting bookmarks (ie. bookmarks which may become useful at a later point in time) and becoming aware of what is available, browsing has definite merits.

URLs

Start with the known. If you can obtain an address of a document which may contain the information you need, you have saved yourself a lot of time searching. Internet magazines concentrate on this search method by providing their readers with pages upon pages of URLs, which the editors have selected and usually categorized by common features. For example, .net magazine has a considerable section in each issue, called "blue pages" which contains a large number of URLs, descriptions of the sites and an editor's evaluation of the pages.

How to write URLs:

- **Open**
- **Ctrl + L**
- **Type URL in location window**

Since URLs are a very important search tool, most browsers provide more than one method of entering a URL. Locate the *Open* button and click on it with your mouse. A window will appear in which you can write the URL in question. When you have finished typing it, make certain that you have spelled it correctly and then click the OK button. Secondly, you can achieve the opening of the URL window by pressing Ctrl + L, if you prefer the keyboard over the mouse. Finally, you can highlight the present URL in the Location window and then type the new URL.

Regardless of the method you use, be careful when writing a URL. URLs are case-sensitive and do not use spaces between characters. If you spell the URL correctly and if the host site accepts visitors (ie. it is not too busy) you will soon see the document specified (or addressed) in your URL.

Lists or Catalogues

There are a number of lists or catalogue sites available on the Internet. These lists have been compiled by individuals or organizations. They are a labour of love but make the search for applicable material so much easier. Most Internet users do not use anything but lists and find all the material they ever want. It is a good idea to have more than one list book marked, since different lists may focus on different materials within the Internet (eg Yahoo, Awesome List).

In essence, a list is a vast collection of URLs, organized in subject trees and many of these allow you to search for specific items; in other words, they contain a search engine within a list.

Search Engines

Whereas Lists give you, in menu fashion, the subjects available, search engines require you to interactively search for the material in question. When you visit a site which offers a search engine, you will find a small window (text box) into which you have to type your keyword(s). Bring your mouse pointer to the empty window, and click on it. You will now see a vertical bar in the window. This is called the cursor and it indicates to you that the window is now ready to receive your typed instructions. If the window has something already written in it, highlight it (drag the mouse over the text) and then type the keyword(s).

Some search engines allow you to conduct complex searches. At the most basic level, you can search for one keyword. Boolean searches, on the other hand, allow you to connect more than one word with words such as "AND" or "OR". For example, if you wish to search for material on Matreshka dolls (you know the dolls that are stacked in each other), you would write these two terms and separate them with a space. Before you submit your search however, look for a window in which you can specify the type of search. For example, Alta Vista allows you to select: either word (OR), or both words together (AND). Select the appropriate parameter and submit your search. In a short time you will see the result of the search. Most search engines will indicate how many hits your search produced. If the number is very large or zero, you may have to select alternate search words. See Appendix C.

Search Tips and Strategies [2]

Is the Internet the place where you can find any- and everything?

Because of its history as a tool for scientists, the Internet is a particularly rich store for information on physics, engineering, and other hard sciences. Resources in the social sciences and humanities have been weaker but are improving. The Internet is also useful to find government information, company press releases and sales figures. Although there is a vast amount of information on the Internet, you may sooner or later find topics for which there is no or only very little information available.

Match your subject to a search method:

For broad searches use a subject-oriented search engine such as WWW Virtual Library.
For more specific searches, use any of the search engines but look for a page that claims to have useful or encompassing links in the area of your search.

Use Boolean searches:

George Boole, a 19th-century English mathematician, pioneered the study of symbolic logic and developed an algebra of logic which became the basis of digital computer circuit design.

Boolean operators are used to determine the truth or falsity of a proposition or logical statement. The most common Boolean operators are: AND, OR, NOT, NEAR. These form the foundation of many database searches and with them one can conduct rather complex and specific searches.

Read the instructions first

There is a problem however: different search engines use the terms differently. One search engine may use "WITH" instead of "AND", others set the default to "AND" whereas others set it to "OR". It pays if you overcome your resistance to read instructions. Almost all search engines have "Search Instructions" and you will avoid frustration, if you read them.

[2] Sandra Stewart, "How to quickly locate what you need to know on the Internet" .net, 09/96, pp. 35-40

Generally speaking Boolean operators work like this:

If I wish to find some information on sailing on Prince Edward Island, I really have two search items: Sailing and PEI. I am not interested in sailing in Bermuda nor am I interested in the yield of potatoes on PEI in this year. Therefore I have to include a Boolean operator that combines these terms and excludes everything else, ie. I would type: sailing AND "Prince Edward Island".

Had I typed: Sailing OR "Prince Edward Island" I would have obtained all the available pages on Sailing and PEI and I would find sailing in Bermuda and the potato yield on PEI for this year.

The Boolean "NOT" is an effective way of narrowing a search. For example, if I wish to search on PEI but do not want information on Charlottetown I could type: "PEI NOT Charlottetown". Some search engines allow the use of the Boolean "NEAR" which means exactly what it implies: find a topic near another one. For example, Toronto AND "Maple Leafs" NEAR hockey. **Note that a search item such as Prince Edward Island is placed within quotation marks to indicate to the search engine that it is only one term and not three separate ones**.

Use at least three search engines

Many Internet users are easily discouraged, if after having explored one search engine for an item, they obtain little or no information. The philosophy or search direction of engines varies and a good researcher runs a Web Search through at least three search engines. With practice you will begin to intuitively know which engines are best for different searches - like when you know which stores are likely to carry certain items or brands.

If you already know a potential source for your information go directly to it

Search engines are helpful if you do not know where to start to look. Lists and specific addresses (URLs) can be in many instances more helpful. For example, if you wish to know when the next high tide in Charlottetown is, you may go directly to the PEI governmental page, provided you know its URL, rather than searching through endless irrelevant documents which may have resulted from a query on a search engine.

With regards to URLs, guessing, according to Zilber and Papageorge (1997) is sometimes faster than searching. If you are looking for the home page of a company with a household name, the odds are pretty good that the URL is **www. companyname. com**. Netscape makes it particularly easy to guess this kind of URL, since it automatically tacks on the "http://www."prefix and the ".com" suffix.[3]

Narrow your search

If your search returns too many hits your search is very likely too broad and not specific enough. Use Booleans, revise and/or change the keywords, change the order of the keywords, or exclude items you do not want to see, with the Boolean "NOT".

Tweak the address

Take a web address and put 'ftp' or 'gopher'where 'http' and 'www' are and you'll be amazed at how much information you get. For example, change http://www.census.gov to ftp://ftp.census.gov and you will land in a directory with lots more information.

What to do if lists, search engines and all the other tricks fail?

Use e-mail and news groups to ask for specific information. This suggestion presupposes however, that you know the e-mail address of someone who happens to know something about your query and/or knows how to find it. (We will discuss how to find e-mail addresses in the section on e-mail). Similarly, you will not be successful in asking members of a news group if you cannot find a news group with the same interests as your query to begin with. Last but not least, do not forget that the Internet cannot contain all information. There may be (often) a time, when you are wiser to go to the local library, phone a local resource, or ask a colleague.

[3] Zilber, J. and Papageorge, J. Simple Search Secrets..net, Feb.97, pp.37-41

Once you have the information can you trust it?

Simply put, NO. The strength of the Web is also its problem. The strength is the vastness of information available, but since anyone can publish on the web (hence the vastness of information) one has to reserve a good dose of scepticism with regard to the accuracy of the information.

Check the sites you visit

There are ways to check:
☞Above all else use common sense.
☞Check to see who published the information you are looking at.
☞Be aware the research reports are biased by the views of the group that publishes the report.
☞Use reliable sites such as government and national and international sources or organizations.
☞Avoid personal or group sites of organization s and individuals that are unfamiliar.

These are a few ways of sifting through some of the material you will see on the Internet. The more experience you gain with this the better you will become at identifying reliable sites.

E-Mail

Pegasus Mail

Pegasus Mail is a user-friendly e-mail program that is available as freeware on the World Wide Web. This means you may download it at no cost for use on your home computer. Pegasus Mail is also the e-mail program that will be used in all of the schools on Prince Edward Island. This section of this manual will take you through all of the necessary steps to becoming an efficient user of Pegasus Mail. Be aware that correspondence either sent or received can be intercepted by third parties. Confidentiality cannot be guaranteed when sending e-mail messages over the Internet.

☞ Sending Mail Messages

File/New Message
OR click on

Click on the word FILE in the menu bar and choose NEW MESSAGE or click on the *New Message* button in the button bar. This screen allows you to prepare new mail messages and replies.

Just as the postal service needs an address in order to deliver a letter, Pegasus Mail needs an address to send electronic mail. Usually an e-mail address follows this format:
username@hostname.

To:

Type the address of the intended recipient of the message in the text box opposite *To:* .

Subj:

Enter a brief description of the message in the text box opposite *Subj:*. This is a very useful piece of information to both the sender and the recipient of the message and should not be neglected since it helps e-mail users keep their messages organized.

Cc:

If you wish to send a carbon copy of your message to someone else, type this person's address in the text box opposite *Cc:* .

Once your message is ready to send you can now set your preferences. Unlike snail mail, e-mail allows you to track your mail, ask for responses etc.

Confirm Reading

Confirm Reading - if you wish to be notified when the recipient reads you message click in the box opposite *Confirm Reading*. A message will be sent back to you when the message is read.

Confirm Delivery

Confirm Delivery - if you wish to be notified when your mail message has been successfully delivered, click the box next to confirm delivery. Confirmation of delivery differs from confirmation of reading in that you are only advised that your message has been delivered to the recipient, not that it has been read.

Copy Self

Copy Self - will save a copy of the message you are sending for future reference. Your copy will be found in a folder called *Copies to Self* which is automatically created the first time you use this option.

Urgent

Urgent - will flag the message as urgent and send the message at high priority to the recipient. The recipient will recognize this message as urgent as it will be written in red text.

Encrypt

Encrypt - this option uses a password system to encode your message so the recipient knowing and using the password will be the only person who can read the message. If you wish to use this feature it is best to make arrangements in advance and agree on a password.

Signature

Signature - will attach your signature file to the end of your message. A signature is specified text that will appear at the end of your message if you so choose. Usually signatures consist of your name, address, phone/fax, although this is a personal choice, and the more concise the better.

To choose any one of these options, click in the box that precedes the option and a checkmark will appear. Note that these options will remain at the settings you have chosen until you make changes. Therefore, all subsequent mail messages will be sent with these same settings until you make a change.

Sending mail messages continued....

Compose the Message

In the large text box at the bottom of the window, type the body of your message. You can spell check your message by selecting CHECK SPELLING from the FILE menu.

Attachments

You can attach files to your mail message by clicking on *Attach* and following the instructions that appear.

Send

When you are satisfied with the message, click on the *Send* button.

☞ Receiving New Mail Messages:

File/Read New Mail OR click on

Click on the word FILE in the menu bar and choose READ NEW MAIL or click on the *Read New Mail* button in the button bar. If you are connected at home you retrieve mail by clicking on FILE/CHECK HOST FOR NEW MAIL. Your *New Mail Folder* will open telling you how many new messages you have received. Messages will be displayed showing the name of the sender, the subject, and the date and time received. Any new mail you receive will automatically be stored in your New Mail Folder until it has been read. To Open a particular message, double click on its name and the content of the message will be displayed in a new window.

Double Click the name of the message

Once the message is open and you have finished reading it, you have several options:

Delete

If the message is unimportant and you do not wish to save it, click on the *Delete* button. Pegasus will ask you to confirm what you are doing. Answer YES if you want to delete the message.

Reply

If you wish to send a reply to the person who sent the message, click on the *Reply* button. You will then be presented with a reply options window. To reply to all the addresses included on the original message, click the top two boxes. To include the original message in your reply, click the bottom two boxes. When the options have been selected, click on OK. A *New Mail Message* window will appear with the To: and Subj: fields already filled in. Simply type in the body of the message and send.

Forward

If you wish to forward the message, click on the *Forward* button. A *Forward Message* window will appear. Type in the address of the person(s) to whom you would like to forward the message. Here you can also choose to edit the message before it is sent or send any accompanying attachments.

Print

If you wish to print a copy of the message, click on the *Print* button. A *Print* window will appear. If the print options are accurate, click on OK.

Move

Move is another option which is discussed in the Mail Folders section of this manual. If you simply choose to close your New Mail Folder after having read your new mail, you will find that messages will no longer be found in your New Mail Folder as all new messages are automatically stored in your *Main Folder* after they have been read.

☞ **Mail Folders**

Mail folders are used to help you organize your mail messages. Organizing your messages into folders makes them easy to retrieve. Pegasus automatically creates a Main Folder for you. The Main Folder is found by clicking on FILE/MAIL FOLDERS. As previously stated this is where messages are automatically stored after they have been read. Once other mail folders are created it is very easy to sort all of your mail directly from the Main Folder.

File/Mail Folders OR click on

To create a new folder click on FILE and choose MAIL FOLDERS or click on the yellow *Folder* button in the button bar. The Folders window will appear.

New
Ok

Click on the *New* button. A *New Folder* window will appear. Type in a long name for the folder. This name could be a subject such as Friends, Newsgroups, School, Language Arts, etc. Click on OK. The new folder will appear in the Folders window.

☞ **Using Mail Folders**

Moving your mail messages from your Main Folder to newly created folders is very easy to do.

Open the Folder
Select the Message
Move

Open the folder that contains the message you wish to move. Click on the message so that it is highlighted, then click on the *Move* button. The Folders window will appear.

Choose a Mail Folder
File/New Messages

Double-click on the folder to which you would like to move the message. The message will be moved to that folder.
Reading the messages in a particular folder is a similar process to reading new mail messages. Click on the word FILE in the menu bar and choose MAIL FOLDERS (or click on the *Mail Folders* button in the button bar). The Folders window will appear.

Open a Mail Folder
Open a Mail Message

Double-click on the mail folder of choice to display its contents. Double-click on the message you want to read, or click once on the message and once on the *Open* button.

Working with Messages that are stored in a Folder

There are several options available for messages that have been stored in mail folders. These are similar to the options that Pegasus Mail allows for new messages. If you wish to use any of these options you must first select a message. This is done by clicking on the message so that it is highlighted. Then simply click one of the options.

Open
Reply

Open: open the message.
Reply: allows you to reply to the message in the same manner as was previously outlined.

Forward

Forward: allows you to forward the message in the same manner as was previously outlined.

Move

Move: moves the message to another folder as was previously outlined.

Copy

Copy: this will make a copy of the message which you can then place in a folder of choice.

Delete

Delete: deletes the message.

Info

Info: this option provides specific information such as the size of the message and whether or not the message came with an attachment.

☞ **Address Books**

Pegasus Mail's *Address Books* will help you keep track of the e-mail addresses of all the people you e-mail most frequently.

Address/Address Books
OR click on

To create an Address Book click on the word ADDRESS and choose ADDRESS BOOKS or click on the *Address Book* icon in the button bar. The *Select an Address Book* window will appear.

New
Name your Address Book

Click on the *New* button. You will be prompted to name your address book. Type a name for the address book.

Ok

Click on OK and the new address book will appear in the Address Book window.

Click on the name of Address Book
Open

Open the address book by highlighting it and clicking on the *Open* button. Your new address book will open.

☞ **Adding Addresses to your Address Book**

Add

To add the e-mail addresses to your address book click on the *Add* button. The *Edit Address Book Entry* window will appear. Fill in the fields with the appropriate information. Press Tab to move from field to field. The only fields that are necessary to fill out are the Name and E-Mail Address fields. All of the other fields are optional. When you have finished, click on OK. Repeat this step until you have entered all of the addresses you wish to include in this particular address book. Remember you can create more than one address book.

☞ **Accessing Address Books**

Address Book
Open

To access an address book that has been created, click on the *Address Book* button and select the address book by clicking once on its name and then clicking the *Open* button. You will then see a list of all the addresses you have entered into this book.
You can use your address book for mailing in three different ways:

☞ **Using Your Address Book to send Mail**

Double Click

1. You can double click an address from your address book to start a new mail message using that address. The address you chose will automatically be copied to the To: field of the New Message window. You are ready to complete your message.

File/New Message or Paste

2. Open a New Message window by clicking on the FILE/NEW MESSAGE or click on the *New Message* button in the button bar. Open your address book and highlight the addresses and then click on the *Paste* button. The addresses you highlighted will be pasted into the *To:* box.

☞ **Selecting more than one Address**

CTRL
Highlight the Addresses
Double Click

To select more than one address simply hold down the Ctrl key and click once on each address. Once all of the addresses are selected double click on one of the addresses selected and they will all appear in the To: field. There is a maximum number of 180 characters that can be entered into an address line. You cannot address an e-mail to an unlimited number of people.

Drag

3. Open a New Message window and an Address Book. Click and drag the addresses from the address book to the To: field of the new message window.

☞ Distribution Lists:

If there is a select group of people whom you e-mail on a regular basis then *Distribution Lists* are a useful tool. Since you have already created an Address Book then this exercise will be easy.

Addresses/Distribution Lists
OR click on

To create a Distribution List click on ADDRESSES in the menu bar and then DISTRIBUTION LISTS.

New List

This is a similar process to the creation of address books: click on the *New List* button. Type in a name for your distribution list. Click on OK. Your new list will appear in the Distribution List window.

Edit

To add addresses to the distribution list: open the list by clicking on it. Then click the Edit button. This will open an editing window.

Address/Address Book
or

Type One Address per Line

Add the e-mail addresses of the people you want to include in your distribution list. If you have already entered these addresses into your address book, open the address book by clicking on the word ADDRESSES and choosing ADDRESS BOOKS. Select the addresses you want to include in the distribution list and drag them into the distribution list editing window. The addresses you selected will now appear in the distribution list. If the addresses you want to include are not already in a book, then simply type the addresses, one per line, in the box labelled One Address Per Line. You can ignore all of the other fields. When you have finished typing all of the addresses click on *save* and your list will be saved.

☞ **Using a Distribution List**

The whole purpose of creating a distribution list is to use it to send a mail message to a group of people at the same time. This will allow you to spend only minutes of your time to send to any number of people. For example you can use a distribution list to send mail to a committee or interest group you belong to, a group of relatives or your children.

Open the List
Addresses/Distribution List

Open the appropriate distribution list by clicking on the word ADDRESSES and choosing DISTRIBUTION LISTS.

Double click the Name of the List
Send

Double-click on the name of the desired distribution list. It will automatically be copied to the To: field in a New Message window. You can now compose the message and send.

Acceptable Internet Use

SurfWatch

The connection of Island schools to the Internet brings with it access to an amazing collection of quality educational resources. Unfortunately, with access to the Internet also comes the availability of inappropriate material that does not support the educational objectives held by school administrators, teachers, and parents. There are several ways in which schools can control students' access to such inappropriate materials. *SurfWatch* is a software program that has been purchased to assist Island schools in restricting student access to unsuitable materials. It has been designed to block access to thousands of websites and newsgroups containing sexually explicit material, hate literature, and graphic violence. *Surfwatch* is currently available to all Prince Edward Island schools upon request; however, *Surfwatch* will not work on a network, only on standalone machines.

P.E.I. Department of Education Acceptable Use Guidelines may be obtained from the Technology Centre.

Acceptable Use Policies (AUPs)

Taking into account the sheer size on the Internet, it is impossible for *SurfWatch* to block access to all objectional material floating out in cyberspace. We believe that the responsibility of using the Internet appropriately rests with the users and, in the case of schools, this means a combined effort of teachers, students, and parents. The Prince Edward Island Department of Education has developed strict guidelines regarding the proper conduct of Internet users. Schools are encouraged to use these guidelines to develop their own Acceptable Use Policies which will outline the responsibilities of teachers, students, and parents when using the Internet. *Acceptable Use Policies (AUPs)* are written contracts between teachers, students, and parents that outline particular terms and conditions for Internet use and the consequences for violating these guidelines. Any user who disregards the provisions contained in the Acceptable Use Policy may have his/her account terminated and future access denied. By diffusing the responsibility of policing the Internet among users, the smooth operation of the Internet in schools will be ensured.

Appendix A
Timeline and Growth Summary

	Hobbes' Internet Timeline v2.5
Sputnik Launched **US forms the Advanced Research Projects Agency (ARPA) within the Department of Defence (DoD)**	1956 USSR launches Sputnik, first artificial earth satellite. In response, US forms the Advanced Research Projects Agency (ARPA) within the Department of Defence (DoD) to establish US lead in science and technology applicable to the military.
	1962 Paul Baran, RAND: "On Distributed Communications Networks". Packet-switching networks; no single outage point.
	1967 ACM Symposium on Operating Principles. Plan presented for a packet-switching network.
	1968 Network presentation to the Advanced Research Projects Agency (ARPA).
ARPANET Commissioned	1969 ARPANET commissioned by DOD for research into networking. First node at UCLA and soon after at: - Stanford Research Institute (SRI) - UCSB - U of Utah - use of Information Message Processors (IMP) [Honeywell 516 mini computer with 12K of memory] developed by Bolt Beranek and Newman, Inc. (BBN). First Request for Comment (RFC): "Host Software" by Steve Crocker.
	1970 ALOHAnet developed by Norman Abrahamson, U of Hawaii. ARPANET hosts start using Network Control Protocol (NCP).

1971 15 nodes (23 hosts): UCLA, SRI, UCSB, U of Utah, BBN, MIT, RAND, SDC, Harvard, Lincoln Lab, Stanford, UIU(C), CWRU, CMU, NASA/Ames.

1972 International Conference on Computer Communications with demonstration of ARPANET between 40 machines organized by Bob Kahn.
InterNetworking Working Group (INWG) created to address need for establishing agreed upon protocols. Chairman: Vinton Cerf.
Ray Tomlinson of BBN invents e-mail program to send messages across a distributed network.

First international connections to the ARPANET

1973 First international connections to the ARPANET: England and Norway.
Bob Metcalfe's Harvard PhD Thesis outlines idea for Ethernet.

1974 Vint Cerf and Bob Kahn publish "A Protocol for Packet Network Internetworking" which specified in detail the design of a Transmission Control Program (TCP).
BBN opens Telnet, commercial version of ARPANET.

1975 Operational management of Internet transferred to DCA (now DISA).
"Jargon File", by Raphael Finkel at SAIL, first released.

1970s Store and Forward Networks.
- Used electronic mail technology and extended it to conferencing.
HM Elizabeth, Queen of the United Kingdom sends out an e-mail.

1976 UUCP (Unix-to-Unix Copy) developed at AT&T Bell Labs and distributed with UNIX one year later.

1977 THEORYNET created at U of Wisconsin providing electronic mail to over 100 researchers in computer science (using uucp).
Computer Science Department research computer network.
USENET established using uucp between Duke and UNC.

1979 Meeting between U of Wisconsin, DARPA, NSF, and computer scientists from many universities to establish a Computer Science Department research computer network.
USENET established using uucp between Duke and UNC by Tom Truscott and Steve Bellovin.

1981 BITNET, the "Because Its Time NETwork"
- Started as a cooperative network at the City University of New York.
- Provides electronic mail and listserv servers to distribute information.
- CSNET (Computer Science NETwork) built by UCAR and BBN through seed money granted by NSF to provide networking services (specially e-mail) to university scientists with no access to ARPANET. CSNET later becomes known as the Computer and Science Network.
Minitel (Teletel) is deployed across France by French Telecom.

1982 INWG establishes the Transmission Control Protocol (TCP) and Internet Protocol (IP), as the protocol suite, commonly known as TCP/IP, for ARPANET.

Transmission Control Protocol (TCP) and Internet Protocol (IP) adopted

- This leads to one of the first definition of an "internet" as a connected set of networks, specifically those using TCP/IP, and "Internet" as connected TCP/IP internets.
- DoD declares TCP/IP suite to be standard for DoD.
Eunet (European UNIX Network) is created by EUUG to provide e-mail and USENET services.

1983 Name server developed at U of Wisconsin, no longer requiring users to know the exact path to other systems.
Cutover from NCP to TCP/IP (1 January).
CSNET / ARPANET gateway put in place.
ARPANET split into ARPANET and MILNET; the latter became integrated with the Defence Data Network created the previous year.
Desktop workstations come into being, many with Berkeley UNIX which includes IP networking software.
Need switches from having a single, large time sharing computer connected to Internet per site, to connection of an entire local network.
Berkeley releases 4.2 BSD incorporating TCP/IP.
EARN (European Academic and Research Network) established. Very similar to the way BITNET works.
FidoNet developed by Tom Jennings.

Domain Name Server (DNS) introduced

1984 Domain Name Server (DNS) introduced.
# of hosts breaks 1,000
JUNET (Japan Unix Network) established using UUCP.
JANET (Joint Academic Network) established in the UK using the Coloured Book protocols.

1986 NSFNET created (backbone speed of 56Kbps).
NSF establishes 5 super-computing centres to provide high-computing power for all (JVNC@Princeton, PSC@Pittsburgh, SDSC@UCSD, NCSA@UIUC, Theory Centre@Cornell).
ARPANET bureaucracy keeps it from being used to interconnect centres and NSFNET comes into being with the aid of NASA and DOE. This allows an explosion of connections, especially from universities.
Cleveland Freenet (start of NPTN) comes on-line.
Network News Transfer Protocol (NNTP) designed to enhance Usenet news performance over TCP/IP.
Mail Exchanger (MX) records developed by Craig Partridge allowing non-IP network hosts to have domain addresses.

# of hosts breaks 10,000

1987 NSF signs a cooperative agreement to manage the NSFNET backbone with Merit Network, Inc. (IBM and MCI involvement was through an agreement with Merit). Merit, IBM, and MCI later founded ANS.
UUNET is founded with Usenix funds to provide commercial UUCP and Usenet access.
1000th RFC: "Request For Comments reference guide"
# of hosts breaks 10,000
# of BITNET hosts breaks 1,000

1988 Internet worm burrows through the Net.

# of hosts breaks 100,000

1989 # of hosts breaks 100,000.
NSFNET backbone upgraded to T1 (1.544Mbps).
RIPE (Reseaux IP Europeans) formed (by European service providers) to ensure the necessary administrative and technical coordination to allow the operation of the pan-European IP Network.
First relay between a commercial electronic mail carrier (CompuServe) and the Internet through Ohio State University.

ARPANET ceases to exist

1990 ARPANET ceases to exist.
Second relay between a commercial electronic mail carrier (MCI Mail) and the Internet through the Corporation for the National Research Initiative (CNRI).
Electronic Frontier Foundation is founded by Mitch Kapor.

1991 Commercial Internet Exchange (CIX) Association, Inc. formed by General Atomics (CERFnet), Performance Systems International, Inc. (PSInet), and UUNET Technologies, Inc. (AlterNet).
WAIS released by Thinking Machines Corporation.
US High Performance Computing Act (Gore 1) establishes the National Research and Education Network (NREN).

The Internet Manual
Timeline and Growth Summary

World Wide Web released

# of hosts breaks 1,000,000

InterNIC created

WWW proliferates at a 341,634% annual growth rate of service traffic

Beginnings of commercialization of the Internet

1992 Internet Society is chartered.
World-Wide Web released by CERN.
# of hosts breaks 1,000,000
NSFNET backbone upgraded to T3 (44.736Mbps).
First MBONE audio multicast (March) and video multicast (November).

1993 InterNIC (Internet Network Information Centre) created by NSF to provide specific Internet services: (:sc1:)
- directory and database services (AT&T)
- registration services (Network Solutions Inc.)
- information services (General Atomics/CERFnet)
US White House comes on-line:
- President Bill Clinton: president@whitehouse.gov
- Vice-President Al Gore: vice-president@whitehouse.gov -
First Lady Hillary Clinton: root@whitehouse.gov
- United Nations and World Bank come on-line
- US National Information Infrastructure Act
- Businesses and media really take notice of the Internet
- Mosaic takes the Internet by storm; WWW proliferates at a 341,634% annual growth rate of service traffic. Gopher's growth is 997%.

1994 Communities begin to be wired up directly to the Internet.
US Senate and House provide information servers.
First flower shop taking orders via the Internet.
Shopping malls arrive on the Internet.
Mass marketing finds its way to the Internet with mass e-mailings.
Worms of a new kind find their way around the Net - WWW Worms (W4), joined by Spiders, Wanderers, Crawlers, and Snakes ...
"A Day in the Life of the Internet" begs to be published.

Real Audio - radio Internet style

1995 NSFNET reverts back to a research network. Main US backbone traffic now routed through interconnected network providers.

Hong Kong police disconnect all but 1 of the colony's Internet providers in search of a hacker. 10,000 people are left without Net access. (:api:).

Real Audio, an audio streaming technology, lets the Net hear in near real-time.

Radio HK, the first 24 hr., Internet-only radio station starts broadcasting.

WWW surpasses ftp-data in March as the service with greatest traffic on NSFNet based on packet count, and in April based on byte count.

Traditional online dial-up systems (Compuserve, American Online, Prodigy) begin to provide Internet access.

Registration of domain names is no longer free. Beginning 14 September, a $50 annual fee has been imposed, which up until now was subsidized by NSF. NSF continues to pay for .edu. registration, and on an interim basis for .gov.

# of hosts approaches 13,000,000

1996 The Internet 1996 World Exposition - the first World's Fair to take place on the Internet.

9,272 organizations find themselves unlisted after the InterNIC drops their name service as a result of not having paid their domain name fee.

American On-Line (AOL) suffers a 19 hour outage, bringing into question whether ISP's will be able to handle the growing number of users.

Restrictions on Internet use around the world:

China: requires users and ISPs to register with the police.

Germany: cuts off access to some newsgroups carried on Compuserve.

Saudi Arabia: confines Internet access to universities and hospitals.

Singapore: requires political and religious content providers to register with the state.

New Zealand: classifies computer disks as "publications" that can be censored and seized. source: Human Rights Watch.

Country domains registered: Qatar (QA), Vientiane (LA), Djibouti (DJ), Niger (NE), Central African Republic (CF), Mauretania (MF), Oman (OM), Norfolk Island (NF), Tuvalu (TV), French Polynesia (PF), Syria (SY), Aruba (AW), Cambodia (KH).[4]

[4] Zakon Robert Hobbes, (1996) Hobbes' Internet Timeline v2.5 ,The Mitre Corp. http://info.isoc.org/guest/zakon/Internet/History/HIT.html

Internet growth summary:

Date	Hosts	Date	Hosts	Networks	Domains
1969	4	07/89	130,000	650	3,900
04/71	23	10/89	159,000	837	
06/74	62	10/90	313,000	2,063	9,300
03/77	111	01/91	376,000	2,338	
08/81	213	07/91	535,000	3,086	16,000
05/82	235	10/91	617,000	3,556	18,000
08/83	562	01/92	727,000	4,526	
10/84	1,024	04/92	890,000	5,291	20,000
10/85	1,961	07/92	992,000	6,569	16,300
02/86	2,308	10/92	1,136,000	7,505	18,100
11/86	5,089	01/93	1,313,000	8,258	21,000
12/87	28,174	04/93	1,486,000	9,722	22,000
07/88	33,000	07/93	1,776,000	13,767	26,000
10/88	56,000	10/93	2,056,000	16,533	28,000
01/89	80,000	01/94	2,217,000	20,539	30,000
		07/94	3,212,000	25,210	46,000
		10/94	3,864,000	37,022	56,000
		01/95	4,852,000	39,410	71,000
		07/95	6,642,000	61,538	120,000
		01/96	9,472,000	93,671	240,000
		07/96	12,881,000	134,365	488,000

Appendix B
Internet in the Classroom

Integrating the Internet into your lesson plans

Once you have discovered the Internet, you will want to share it with your students. Integrating the Internet into your "tried and true" learning activities is easy if you have a plan. Develop and look for lesson plans that include a least two of the following ten essential features.

What to look for: Essential features of the Internet lesson plan

Comparing: Looking at similarities and differences between concepts, attitudes, objects, etc.
Constructing support: Developing support for an argument or proof for an assertion.
Classifying: Categorizing things based on defining features or attributes.
Inducing: Inferring generalizations from known observations and analysis.
Deducing: Inferring consequences and conditions from known generalizations.
Analysing Errors: Recognizing errors in one's own thinking and the thoughts of others.
Abstraction: Recognizing and articulating unstated themes or general patterns of information.
Analysing Perspectives: Recognizing and reflecting on personal perspectives.
Information Gathering: Gathering information from various sources.
Team Work: Working collaboratively toward a common goal.

Finding the resource links you need

LESTER:
www.gov.pe.ca/educ/lester

Second, go on-line in search of resource links that could support these lesson plans. Try using LESTER as a starting point to finding educational resources. Keep a close watch for other educators who are integrating the Internet into their learning experiences. They can be a tremendous source of integration ideas and advice.

Being well-prepared

Third, give your newly "wired" lesson plans a try before getting your students involved. When using the Internet with your students, you must be prepared for anything. Knowing the obstacles and pitfalls beforehand will make your lesson unfold smoothly.

Evaluating and improving

Finally, you are ready to involve your students in these exciting new learning experiences. Be sure to record any observations or comments about the experiences so they can be improved.

Five types of Internet projects

Once you have begun integrating the Internet into your daily learning experiences, you may consider joining an Internet project or designing one of your own. Generally there are five types of Internet projects. Of course, each is more suited for different grade levels and subject areas.

Online correspondence: Involving keypal connections between students or subject matter experts.
Information gathering: Using the Internet as a research tool to collect and exchange information, to create and respond to questionnaires, or to support curriculum materials.
Competitions: Searching the Internet to answer questions or solve problems (scavenger hunts, trivia challenges)
Interactive writing: Involving joint writing projects where students collaboratively write, respond to, and critique pieces of text.
Online conferencing: Requiring the supervised use of online chat rooms or audio/video conferencing software to enable students to immediately communicate with one another or with on-line experts.

Various sites on the Internet provide lists of on-line projects that your class may join as well as guidelines for planning your own on-line projects. A visit to such sites will give you an idea where to start and what to expect.[5]

[5] Classroom Connect.(1996) Internet Integration 101, Vol.3, Number 2.

Some ideas to get you started

Suggestions of Classroom Internet Activities

Note: It is recommended that the following exercises and activities be introduced when students are familiar with Internet searches. Since the Internet is viewed, in the present context, as a research tool, it stands to reason that students must have the information processing skills required for a specific task.

Internet Hunts

Internet Search Skills

- *Design Internet Hunts.* These are lists of questions and queries to which students must find the answers on the Web. Although it is helpful for the teacher to find the answer(s) prior to giving this assignment, one should be aware that the answers to many questions can vary, depending on obtained sites. For this reason, it may be of advantage to give the students structured answer sheets. For example:

  It is 4pm in Charlottetown, PE and you wish to contact a friend in Hong Kong. What time is it there?
  Answer:_____
  URL where answer was obtained:
  _____
  Which search word(s) did you use:
  _____
  Which search engine or List did you use:
  _____

Bookmark Files

- *Student-created bookmark files on specific topics.* Ask students to erase the present bookmarks from their bookmark files and then collect bookmarks on specific topics over the next period(s). At the end of the assignment, have students print out the list of obtained bookmarks, as well as a short description of each. For example:

  Make a bookmark file of what you consider to be the best and most interesting sites providing information on Christmas in other countries. Save these bookmarks, test them and write a short commentary on each.
  URL: _____
  Title of Homepage: _____
  Describe what the user will find on this site:
  _____

Practical Extension:
This assignment can provide a tremendous resource library for teachers and students in almost all subject areas and many topic areas. To compile each bookmark file into a bookmark library, have students hand in their bookmark files on disks, open a new file (ie. erase the present one after you have made a backup copy of it!!) and then import one bookmark file after the other. In the BOOKMARK menu select GO TO BOOKMARKS and then select FILE and IMPORT. Then specify the path and name of the file (usually: A:\bookmark.htm) and repeat this for all disks. There will be some duplication of bookmarks but these can easily be cleaned up later.

Researching Sites

- *Students use URLs to access specific sites and describe the information that can be gained by a visit to the specified site.* This exercise forces students to pay attention to detail and the correct typing of URLs. It also allows the students to better understand that in WWW every document has its unique address.

Practical Extension:
Repeat the above exercise but now ask students to change the URL by erasing the file name at the end of the URL. This will allow students to explore directory structures of various websites. Moreover it teaches them that sometimes they can access more information than what they see on the screen. Ask students to erase directories names until they arrive at the parent directory of the sponsoring organization.

Publishing Text

- *Students "publish" favourite pieces of text.* Students bring in a favorite piece of text (poem, excerpt from a novel, song) or find one on the Internet. Once they have written it out on a word processor, it should be formatted to their liking. The goal of their formatting is to make it publishable. Next they have to find a suitable picture on the Internet and import this into the page containing the poem. The skills taught here include transfer of material from the Internet to a word processor, inclusion of graphics files, and desk-top publishing. Although this is an advanced skill, students at an introductory level may restrict themselves to text only.

Internet Schnitzeljagd

Internet Schnitzeljagd. This is a take-off on a game played by the European jet set in the 60s. A person plays the fox to be hunted by the pack. The fox has one or two days to make his/her getaway before the pack starts the hunt. The fox must leave a clue (Schnitzel) in a place which would point to his next destination. If the fox is caught before reaching home again the pack wins, otherwise the fox obtains the prize. In the case of the Internet, the teacher assumes the role of the fox and gives the class the entire route through Schnitzels. The task of the class (teams or individuals) is to trace the escape route of the fox.

For example the following schnitzels may be given:

> Largest city near the place from which universal time is taken --> what skiing am I doing on the Holmenkollen --> this city was once called Christiania, what is it called now -->experienced travellers agree this is the most exciting city. It is also known for its Oktoberfest --> meet me at the Mona Lisa --> the cradle of jazz -->I wait for you at the O'Keefe Centre.

Note that each Schnitzel contains a keyword. In the above case, the keywords are easily recognizable but can be made much more challenging. Although the above restricts itself to geographic identifications, the game can be applied to almost any subject area, eg. history, art, anatomy, literature, etc.

Corresponding with other countries

- *Students find the address of a Canadian embassy or consulat in another country which can either be assigned by the teacher or chosen by the student.* Once the address has been obtained, students should write an e-mail letter to the embassy requesting printed and other suitable material concerning the country in question.

Researching current events

- *Students research in depth any news item or an item of international concern and/or controversy.* It is important to encourage students to research both sides of the argument and arrive at a judgment if and only if, the research has been exhausted. Examples can be found in almost any daily news broadcasts but old standbys are: Whaling, transport of atomic garbage, Greenpeace, expansion of NATO, immigration policies, language rights, etc.

Creating lists of URLs

- *Students create a list of URLs (similar to Yahoo!) for different subject areas.* For example find addresses that relate to a certain author, his or her works and related topics. Each link should be explained with a brief comment. This task involves cut & paste of URLs as well as mastery of searching techniques. Students are well advised not to organize the material before hand but rather collect as many sites as possible and then to organize the obtained material within their word processor.
  If the class has been introduced to HTML programming, this assignment can be expanded to include the creation of a web page. The result can be very beneficial for teachers, who can concentrate on the obtained sites rather than having to search themselves.

Some Considerations of Internet Classroom Use

PEI statement on Information Technology in our schools reinformces the philosophy that:
Before using the Internet with your students, you must set the scene for working with this new resource tool.

Discussion of AUPs

- Discuss the Acceptable Use Policy developed by your school. By making sure everyone understands their responsibilities when using the Internet, you will proactively eliminate misunderstandings that may arise later.

Internet as an educational tool

- Convey the attitude that, during school hours, the Internet will be used as an educational tool. Many times, the Internet is used a source of entertainment. However, this type of use is inappropriate during school hours and should be reserved for special times designated at the end of the day or after school.

No disclosure of personal information

- Warn students not to disclose any personal information while on the Internet. This is a precautionary measure to guard against unsolicited contact of the students by other individuals.
  Your school may also consider restricting students' participation in chat lines. Many chat lines available are of questionable educational value.

Plan for AUP violations

- Formulate a plan for responding to violations of Acceptable Use Policies. This can be done as a whole class or as a whole school or through your school's technology committee.

When using the Internet with your students, you must be well-prepared.

An Internet lesson plan

- Any Internet session should start with a well-developed plan of what you want to accomplish while using the Internet. Knowing where you are heading and what obstacles you can stumble upon along the way will help to make the Internet experience relevant and meaningful for students.

Critical thinking skills

Given the characteristics of the Internet, it is important to explain that information found on the Internet should be critically evaluated. Since anyone with a general knowledge of HTML programming can create a home page and post it on the Internet, it is vitally important to stress the need to practice critical thinking skills when reviewing websites.

Appendix C
Search Engine Comparison [6]

Alta Vista **www.altavista.digital.com**	Search WWW and Usenet. Claims to have indexed 30 million URLs.
Search and Keyword specifications:	
Case sensitivity	Uncapitalized keywords are always case-insensitive. Any capital letter and accent marks render a keyword case-sensitive.
Wildcards	To find plurals, or alternate spellings, insert a wildcard in the word or at the end of the word.
Phrase search	To search for a phrase or a group of words which should be treated as one unit, enclose the phrase with quotation marks, or punctuation marks.
Return conditions	A plus sign in front of a term requires its inclusion in returns; a minus sign prohibits its inclusion.
Booleans	Boolean operators: AND, OR, NEAR, AND NOT. NEAR returns keywords that are within 10 words of each other. Note that the Boolean 'NOT' must be "AND NOT"
Excite **www.excite.com**	
Search and Keyword specifications:	Search WWW, Usenet news, Usenet classifieds, Excite Reviews. Claims to have indexed 50 million URLs.
Natural languages	Allows natural language searches (eg. Where do I find Mona Lisa).
Capitalization	Two words with initial capitalization are considered proper names. By default, multi term searches use the Boolean 'OR'.

[6] The Netsearcher's Ultimate Cheat Sheet. (1996), PC Magazine, December 1996

Phrase search	To search for a phrase or a group of words which should be treated as one unit, enclose the phrase with quotation marks, or punctuation marks
Booleans	Allows AND, OR, NOT, and AND NOT. Note the difference between NOT and AND NOT.
Weighing of keyword	You can weigh keywords by placing the tilde (^) symbol and a number (eg. Pentium ^2 processors).
HotBot **www.hotbot.com**	Search WWW and Usenet. Claims to have indexed 54 million URLs.
Search and Keyword specifications:	
Specification Selection	Has drop-down list to select search specifications (what must and must not appear). Does not support wildcards.
Booleans	Booleans are supported through drop-down lists (AND and OR).
Lycos **www.lycos.com**	Search WWW, sounds, pictures, or subjects through Lycos' A2Z catalogue. Claims to have indexed 66 million URLs.
Search and Keyword specifications:	
Booleans:	By default uses Boolean OR and wildcards (loose match searches).
Return conditions:	Return conditions are set with symbols, namely, a period (.) after the keyword will elicit an exact match; a Dollar sign ($) after the keyword is used as a wildcard, and a minus sign before the keyword will exclude it. Booleans are restricted to AND (OR is the default).

Open Text **index.opentext.net**	You can search: WWW, news groups and e-mail addresses. Claims to have indexed 20 million URLs.
Search and Keyword specifications	
Default setting	By default uses the Boolean operator AND. Does not stem words, which means the singular and plural version of a word must be used as separate keywords.
Search Restrictions:	Allows you to specify where you wish to find the keyword, for example, anywhere on the page, title, header, etc.,
Booleans:	Uses these operators: AND, OR, BUT NOT, NEAR (within 80 words on the same page) and FOLLOWED BY.
WebCrawler: **www.webcrawler.com**	Search the WWW. Claims to have indexed 2 million URLs. By many considered to be the basic search engine which is ideal to start your searches.
Search and Keyword specifications	
Search Default	By default returns pages that contain any of your keywords (Boolean OR).
Booleans:	Allows AND, OR, NOT as well as the following Boolean proximity operators: NEAR and ADJ. If you specify a number after the NEAR operator (eg. car/10 insurance) your keywords must appear within x words (eg. 10) of each other. The ADJ operator specifies that the words must appear next to each other in the order specified.

Appendix D
Glossary [7]

Archie	A search tool that helps you to locate program files at *FTP* sites.
Backbone	The main communication line that ties computers at one location with those at another.
Bandwidth	An indication on how fast information flows through a computer network. Bandwidth is usually stated in thousands or millions of *bits* per second.
Bit	The basic unit of data. It takes eight bits (a *byte*) to represent a character.
Byte	The memory space required to store one character (eight *bits*). Usually expressed as kilobytes (kb) which is 1024 bytes of data, megabyte (mb) which is 1,048,576 bytes, and gigabytes (gb) which is 1000 mb.
Dedicated line	A telephone line that is leased from the telephone company and used for one purpose, for example, to connect the network of organizations to an Internet *Service Provider (ISP).*
Dial-in connection	A way to access a computer on the Internet using a PC, telephone line and a *modem.*
Domain	The system of organizing the Internet according to country or type of organization. Countries have a 2-letter suffix, such as CA, DE, NO and organizations a 3-letter suffix such as org (organization), com (commercial), edu (education), mil (military), gov (government), etc.,
Domain Name System (DNS)	The system used to define and name individual Internet hosts.

[7] Adopted from: Unisys, Information Superhighway Driver's Manual. Unisys Corporation, 1995

Download	Refers to transferring data (a file, a program, mail, etc.,) from one computer (called the host) to your computer (also called the client).
E-Mail	The process of sending and receiving mail electronically. It also refers to the electronic message per se.
FAQ	List of Frequently Asked Questions about a particular topic. Usually found in News groups.
Fire wall	A mechanism to prevent unauthorized access to a given network or host computer.
FTP	File Transfer Protocol is a set of rules that allows computers to *down-* and *upload* files. It is an Internet resource that specializes in the transfer of files.
Gateway	A system that connects two incompatible networks with each other. Gateways permit different e-mail systems to pass messages between them.
Gopher	An Internet resource that provides menus and a specific search engine (*Veronica*) to facilitate navigation and finding of information.
GUI	Graphical User Interface enables users to interact with computers and computer systems through graphical symbols (icons) rather than arcane commands typed on the keyboard.
Host	A server computer linked directly to the Internet and "hosting" files to be accessed by the individual users.
HTML	Hypertext Markup Language, the code used to format documents for publication on the Internet.
Hypertext	Text within an electronic document that links to other documents.

The Internet Manual
Glossary

Internet	An interconnection of thousands of separate networks worldwide.
ISP	Internet Service Provider, a company or organization that provides access to the Internet (eg. Sympatico, PEInet, etc)
IRC	Internet Relay Chat, a software and an Internet resource that lets users hold keyboard conversations.
LAN	Local Area Network, a collection of computers in geographical proximity which are connected via cables. These computers can share data, softwares and hardware such as printers.
News groups	An Internet resource which allows electronic discussion groups to receive and post questions, answers, and announcements.
Router	A special computer that acts as a traffic director on the Internet for data to travel among different networks.
TCP/IP	Transmission Control Protocol/Internet Protocol, a set of communication rules that specifies how data are transferred among computers on the Internet. It is the common "language" of all Internet computers.
Telnet	An Internet resource that allows users to connect to other computers.
Upload	The reverse process of *downloading*. It refers to transferring data from your computer to a host computer.
Veronica	The search engine of *Gopher*.
WWW	World Wide Web, an Internet resource with three specific characteristics, namely, *GUI, hypertext* and *URLs*.
URL	Uniform Resource Locator, the address of a *WWW* document. Every WWW document has its unique *URL*.